



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,183	02/26/2002	Shingo Ishihara	500.41280X00	2432

20457 7590 02/02/2004

ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-9889

EXAMINER

KRISHNAN, SUMATI

ART UNIT	PAPER NUMBER
----------	--------------

2875

DATE MAILED: 02/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/082,183

Applicant(s)

ISHIHARA ET AL.

Examiner

Sumati Krishnan

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____.

DETAILED ACTION

Response to Arguments

Regarding the rejection of independent claims 1,3, and 5, the examiner withdraws the rejection of the office action of 5/8/2003 in reference to Fukuda (US 6541130). However, a new rejection in view of Onitsuka (US 6049167) is presented.

Regarding the rejection of independent claims 2 and 4, the examiner holds that the conductive films of Nagayama (US 5742129) qualify as a "light extraction layer."

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claim 2 and 6-7 and 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagayama et al (US 5742129). Nagayama discloses an organic light emitting element comprising an organic electroluminescent substrate having a first electrode (4), an organic layer (6), and a second transparent electrode (9) formed on a substrate (10), a counter substrate (10), and a light extraction layer (Nagayama's conductive film on either side of insulating substrate qualify as a "light extraction layer") located between the organic electroluminescent substrate and the counter substrate. Nagayama also discloses ribs (or

ramparts, 7) provided between the organic electroluminescent substrate and the counter substrate. The limitation that the ribs are 'to control a thickness....' is not given patentable weight because it is considered an intended use statement. Regarding claim 7, the conductive films (light extraction layers) are from 100-500 microns thick, thus being greater than 50 microns. Regarding claim 11, Nagayama discloses a "color filter"(shadow mask 30) formed between the organic electroluminescent substrate and the counter substrate. Regarding claim 12, the color filters are formed "on" the counter substrate (via the second transparent electrode).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onitsuka (US 6049167) in view of Tang et al (US 5684365). Onitsuka discloses an organic light emitting display comprising light emitting elements that comprise a first electrode, an organic layer, and a second electrode all formed on a substrate. Onitsuka discloses an EL device wherein the thickness (d) of a distance from the light emitting layer to an air interface satisfies the formula $d < \lambda / (4)$. The examiner notes that Onitsuka discloses the preferred thickness of the layer D13 (light emitting layer) ranging from 5-100 nm, (see Col.

7; line 63) that of the transparent electrode D15 ranging from 10-100 nm (see Col. 7, line 14), and the layer D14 ranging from at least 50 nm. Therefore, the combined thickness of these layers is, in one embodiment, preferably $5 + 10 + 50 = 65$ nm, which satisfies the above equation when the light emitted out of layer D13 is greater than 260 nm, which is done in examples one and two. Onitsuka does not disclose specifically disclose layer D14 being a passivation layer. However, Tang discloses a passivation layer (74) used in an organic electro-luminescent device. A passivation layer protects the device from unwanted electrical interference. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made layer D15 of Onitsuka a pasivation layer for protection of the device.

Regarding claim 21, Onitsuka discloses that the light emitting element corresponds to each of red, green, and blue in each pixel.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama et al (US 5742129) in view of Onitsuka (US 6049167). Nagayama discloses an organic light emitting element comprising an organic electroluminescent substrate having a first electrode (4), an organic layer (6), and a second transparent electrode (9) formed on a substrate (10), a counter substrate (10), and a light extraction layer (conductive films on insulating substrates) between the organic electroluminescent substrate and the counter substrate. Nagayama does not disclose a total thickness d of a layer ranging from a light emitting area in the organic layer to the second transparent electrode satisfying an equation d being less than or equal to a quarter of the center wavelength of emitted light. Onitsuka, however, discloses an organic light emitting element comprising a first electrode, an organic layer, and a second electrode all formed on a substrate,

wherein a distance 'd' from a light emitting area in the organic layer to an air layer into which produced light enters, satisfies the equation 'd' is less than or equal to one quarter of the center wavelength of the emitted light. Choosing a thickness of a quarter wavelength of the emitted light is well known to suppress reflection and promote maximum transmission of light. Therefore, it would have been obvious to have used the thickness of quarter wavelength in the invention of Nagayama in order to maximize transmission of light.

4. Claims 4 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al (US 4954746) in view of Nagayama (US 5742129). Taniguchi discloses a light emitting element comprising an electroluminescent substrate having a first electrode (12), a luminescent layer (14), and a second transparent electrode (16) formed on a substrate (11), a counter substrate (1), and a light extraction layer (conductive films on insulating substrates) and an auxiliary electrode, (6) both provided between the electroluminescent substrate and the counter substrate. Taniguchi does not disclose the light emitting layer being organic. However, Nagayama discloses an electroluminescent display panel using organic layers as the light emitting layers. Organic layers typically have a faster response time and make the device lighter in weight than inorganic substances. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the organic layers of Nagayama as the light emitting layers of Taniguchi because of the advantages listed above.

Regarding claims 15 -18, Taniguchi discloses the auxiliary electrode 6 formed between pixels, and 'on' the counter substrate, as well as "on" the second transparent electrode (2). A bonding layer is provided in order to bring electrodes 2 and 6 in electrical contact. See figure 5.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al (US 4954746) in view of Nagayama (US 5742129) in further view of Fukuda (US 6541130). Taniguchi discloses a light emitting element comprising an electroluminescent substrate having a first electrode (12), a luminescent layer (14), and a second transparent electrode (16) formed on a substrate (11), a counter substrate (1), and a light extraction layer (conductive films on insulating substrates) and an auxiliary electrode, (6) both provided between the electroluminescent substrate and the counter substrate. Taniguchi does not disclose the light emitting layer being organic. However, Nagayama discloses an electroluminescent display panel using organic layers as the light emitting layers. Organic layers typically have a faster response time and make the device lighter in weight than inorganic substances. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the organic layers of Nagayama as the light emitting layers of Taniguchi because of the advantages listed above.

Neither Taniguchi or Nagayama discloses a thickness d of a layer ranging from a light emitting area in the organic layer to the second transparent electrode satisfying d being less than or equal to a quarter wavelength of emitted light.

Onitsuka, however, discloses an organic light emitting element comprising a first electrode, an organic layer, and a second electrode all formed on a substrate. Fukuda discloses that a distance ' d ' from a light emitting area in the organic layer to an air layer into which produced light enters, satisfies the equation ' d ' is less than or equal to one quarter of the center wavelength of the emitted light. Choosing a thickness of a quarter wavelength of the emitted light is known to suppress reflection and promote maximum transmission of light. Therefore, it

Art Unit: 2875

would have been obvious to have used the thickness of quarter wavelength of Onitsuka in the invention of Nagayama in order to maximize transmission of light.

6. Claims 8-10 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama et al (US 5742129) in view of Takahashi (US 5804917). Nagayama discloses the organic light emitting element according to claim 6, but does not disclose the rib being formed on the counter substrate. Takahashi, however, discloses an organic light emitting element having a glass rib (8) formed on the counter substrate (1), on a “sealed portion” of the organic electroluminescent substrate and counter substrate (see element 5 which facilitates the ‘sealing.’). Takahashi discloses that forming the rib on the counter substrate serves to provide extra support to the substrate. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the rib of Takahashi located on the counter substrate, in the invention of Nagayama in order to provide increased support.

Regarding claims 13-14, Takahashi discloses a “moisture absorbing layer” (seal layer 5) provided on the counter substrate and around a portion sealing the organic electroluminescent substrate and the counter substrate.

7. Claims 19 and 22 are rejected under 35 U.S.C. 103(a) Nagayama et al (US 5742129) in view of Onitsuka (US 6049167) further in view of in view of Tang et al (US 5684365). Nagayama discloses an organic light emitting display comprising an organic electroluminescent substrate having a first electrode (4), an organic layer (6), and a second transparent electrode (9) formed on a substrate (10), a counter substrate (10), and a light extraction layer (conductive films on either side of insulating substrate) located between the

organic electroluminescent substrate and the counter substrate. Nagayama discloses the second electrode being transparent and made out of a thin metallic film. Nagayama does not, however disclose the distance d satisfying the equation of claim 1, or a passivation film. Fukuda discloses an organic light emitting element comprising a first electrode, an organic layer, and a second electrode all formed on a substrate. Onitsuka discloses that a distance 'd' from a light emitting area in the organic layer to an air layer into which produced light enters, satisfies the equation 'd' is less than or equal to one quarter of the center wavelength of the emitted light. Choosing a thickness of a quarter wavelength of the emitted light is known to suppress reflection and promote maximum transmission of light. Therefore, it would have been obvious to have used the thickness of quarter wavelength of Fukuda in the invention of Nagayama in order to maximize light transmission.

Onitsuka does not disclose specifically disclose layer D14 being a passivation layer. However, Tang discloses a passivation layer (74) used in an organic electro-luminescent device. A passivation layer protects the device from unwanted electrical interference. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have made layer D15 of Onitsuka a pasivation layer for protection of the device.

8. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Onitsuka (US 6049167) in view of Tang et al (US 5684365) in further view of Pichler (US 5929562). Fukuda and Tang together disclose the light emitting display of claim 20. Neither, however, disclose the use of the organic display in a mobile phone. However, Pichler discloses using electroluminescent elements in electronic display devices such as mobile phones. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to

Art Unit: 2875


have included the electroluminescent element of Onitsuka and Tang in a display portion of a mobile phone as disclosed by Pichler because of their high resolution.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sumati Krishnan whose telephone number is 571-272-2372. The examiner can normally be reached on 8:00 am - 4:30 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on 571-272-2378. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

SK



Sandra O'Shea
Supervisory Patent Examiner
Technology Center 2800